

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		ATTORNEY'S DOCKET NUMBER  0234/00072	
		U.S. APPLICATION No. (Unknown, see 37 CFR 1.5) <b>097/868665</b>	
INTERNATIONAL APPLICATION NO.  PCT/GB99/04334 ✓	INTERNATIONAL FILING DATE  21 December 1999 ✓	PRIORITY DATE CLAIMED  21 December 1998 ✓	
TITLE OF INVENTION  ELECTRICAL SURGE ARRESTERS			
APPLICANT(S) FOR DO/EO/US  DOONE, Rodney Meredith, SHORT, Patrick George ✓			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371</li> <li>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. § 371.</li> <li>3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</li> <li>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</li> <li>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> <li>a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</li> <li>b. <input type="checkbox"/> has been transmitted by the International Bureau.</li> <li>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ol> </li> <li>6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</li> <li>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</li> <li>b. <input type="checkbox"/> have been transmitted by the International Bureau.</li> <li>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li>d. <input type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</li> <li>10. <input type="checkbox"/> A translation of the Annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</li> </ol>			
<b>Items 11. to 16. below concern other document(s) or information included:</b>			
<ol style="list-style-type: none"> <li>11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li>13. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> <li>14. <input type="checkbox"/> A substitute specification.</li> <li>15. <input type="checkbox"/> A change of power of attorney and/or address letter</li> <li>16. <input checked="" type="checkbox"/> Other items or information:  Copy of the International Search Report</li> </ol>			

U.S. APPLICATION NO. (If known, see 37 CFR 1.5) <div style="font-size: 24pt; font-weight: bold;">09/868665</div>		INTERNATIONAL APPLICATION NO. PCT/GB99/04334		ATTORNEY'S DOCKET NUMBER 0234/00072	
<input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS	PTO USE ONLY
<b>Basic National Fee (37 CFR 1.492(a)(1)-(5)):</b> Search Report has been prepared by the EPO or JPO.....\$860.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) .....\$690.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)).....\$710.00  Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....\$1,000.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4).....\$100.00					
<b>ENTER APPROPRIATE BASIC FEE AMOUNT = \$860.00</b>					
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				<b>\$130.00</b>	
Claims	Number Filed	Number Extra	Rate		
Total Claims	5 - 20 =	0	X \$18.00	\$0.00	
Independent Claims	1 - 3 =	0	X \$80.00	\$0.00	
Multiple dependent claim(s)(if applicable)			+ \$270.00	\$0.00	
<b>TOTAL OF ABOVE CALCULATIONS = \$990.00</b>					
Reduction by 1/2 for filing by small entity, if applicable.				<b>\$0.00</b>	
<b>SUBTOTAL = \$990.00</b>					
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				<b>\$0.00</b>	
<b>TOTAL NATIONAL FEE = \$990.00</b>					
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				<b>\$0.00</b>	
<b>TOTAL FEES ENCLOSED = \$990.00</b>					
				Amount to be:	
				refunded \$	
				charged \$	
a. <input type="checkbox"/> A check in the amount of \$_____ to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. <u>22-0185</u> in the amount of \$_____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input type="checkbox"/> The Director is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>22-0185</u> . A duplicate copy of this sheet is enclosed.					
<b>NOTE:</b> Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b) must be filed and granted to restore the application to pending status <b>SEND ALL CORRESPONDENCE TO:</b>					
<b>Connolly Bove Lodge &amp; Hutz LLP</b> 1990 M Street, N.W., Suite 800 Washington, DC 20036-3425			<div style="text-align: center;">           SIGNATURE          Morris Liss          NAME          24,510          REGISTRATION NUMBER       </div>		

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: :  
:   
Rodney Meredith Doone et al. :  
:   
Serial No.: To be assigned : Art Unit: To be assigned  
:   
Filed: Herewith : Examiner: To be assigned  
:   
For: ELECTRICAL SURGE : Atty Docket: 0234/00072  
ARRESTERS :  
:   
:   
:

PRELIMINARY AMENDMENT

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to initial examination, please amend the above-captioned case as follows.

IN THE ABSTRACT

Please add the Abstract of the Disclosure attached hereto on a separate sheet.

IN THE CLAIMS

Please cancel claim 6 and amend claims 3-5 to read as follows:

3. (Amended) A high voltage surge arrester as claimed in claim 1 wherein the corona suppression means at the ends of the limbs of the or each said mounting bracket supporting the ends of adjacent serial stages of the arrester comprise individual bodies associated each with a respective one of the limbs.

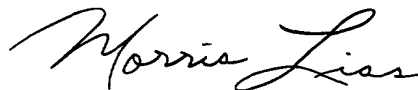
4. (Amended) A high voltage surge arrester as claimed in claim 1 which is adapted for station class operation and wherein the low voltage surge arresters are distribution class surge arresters.

5. (Amended) A high voltage surge arrester as claimed in claim 1 wherein the low voltage surge arresters are polymer housed solid state surge arresters.

### R E M A R K S

The claims have been amended to eliminate multiple dependency and to improve their format. None of these amendments is believed to involve any new matter. Accordingly, it is respectfully requested that the foregoing amendments be entered, that the application as so amended receive an examination on the merits, and that the claims as now presented receive an early allowance.

Respectfully submitted,



Morris Liss, Reg. No. 24,510  
Connolly Bove Lodge & Hutz LLP  
1990 M Street, N.W., Suite 800  
Washington, D.C. 20036-3425  
Telephone: 202-331-7111

Date: 6/20/01

## ABSTRACT OF THE DISCLOSURE

A high voltage (station class) surge arrester comprises a plurality of serially connected stages. Each stage comprises a plurality of low voltage (distribution class) polymer housed solid state surge arresters which are electrically matched. The individual surge arresters of each stage are connected together and to the respective surge arresters of the (or each) adjacent stage by means of cast metal mounting brackets (spiders) having plural equiangularly-spaced limbs to the ends of which the surge arresters are attached. Corona suppression rings are mounted at the top end of the arrester and separate corona suppression components are mounted at the ends of the limbs of the intermediate stages.

## AMENDMENTS TO THE CLAIMS

3. (Amended) A high voltage surge arrester as claimed in claim 1 [or 2] wherein the corona suppression means at the ends of the limbs of the or each said mounting bracket supporting the ends of adjacent serial stages of the arrester comprise individual bodies associated each with a respective one of the limbs.
4. (Amended) A high voltage surge arrester as claimed in [any of the preceding claims] claim 1 which is adapted for station class operation and wherein the low voltage surge arresters are distribution class surge arresters.
5. (Amended) A high voltage surge arrester as claimed in [any of the preceding claims] claim 1 wherein the low voltage surge arresters are polymer housed solid state surge arresters.

Improvements Relating to Electrical Surge ArrestersField of the Invention:

This invention concerns improvements relating to electric surge  
5 arresters, also known as surge diverters, as used in electrical power generation  
and distribution systems for the safe handling of atmospherically induced  
surges, arising from lightning strikes for example, and over-voltages caused  
by switching operations.

Background of the Invention:

10 We pioneered the introduction of polymer housed solid-state  
distribution class surge arresters, as disclosed in GB-A-2188199 for example,  
and in GB-A-2230661 we proposed the utilization of a series parallel  
arrangement of a plurality of such distribution class surge arresters as a station  
class surge arrester. Distribution class surge arresters generally have voltage  
15 ratings of the order of 24 to 36 kV and by coupling together a plurality of  
electrically matched such distribution class surge arresters in a series parallel  
arrangement as described in GB-A-2230661 much higher voltage ratings of  
the order of 120 to 456 kV can be accommodated.

Our series parallel station class surge arrester is designed to replace the  
20 conventional porcelain housed station class arrester and has been widely  
acclaimed. The present invention concerns improvements in the construction  
of the series parallel arrester.

Summary of the Invention:

Whereas in the series parallel surge arrester described in GB-A-2230661 the individual distribution class surge arresters of adjacent serial stages were offset from each other, the present invention proposes to provide the arrester units in line throughout the series parallel arrangement. Furthermore, whereas in the surge arrester of GB-A-2230661 metal mounting plates formed integrally with corona suppression rings at their peripheries were utilized for interconnecting adjoining stages of the series parallel arrangement, the present invention proposes a more simple and cost effective arrangement employing multiple-limbed brackets (spiders) in place of the mounting plates, the distal ends of the limbs being provided with corona discharge inhibiting surfaces.

The above and further features of the present invention are set forth with particularity in the appended claims and will be well understood from consideration of the following description given with reference to the accompanying drawing.

Description of the Drawing:

The single figure of the accompanying drawing illustrates the upper (top) end of an exemplary series parallel surge arrester according to the present invention in perspective view.



Detailed Description of the Embodiment:

The series parallel surge arrester shown in the accompanying drawing comprises a plurality of series-connected stages I, II, etc (only the top two of which are shown) each made up of four electrically matched surge arresters 1 which can, for example, be of the kind described in GB-A-2188199 but could be otherwise formed so long as they exhibit sufficient structural integrity. The individual surge arresters 1 in each stage I, II, etc are coupled together and to the adjoining arresters of the next adjacent stage by means of cast metal brackets (spiders) 2 having a plurality of limbs 3 extending from a central body portion 4 with even angular spacing of 90°. As can be seen, the individual surge arresters 1 of the different stages are aligned with each other.

The individual surge arresters 1 have externally screw-threaded end fixing studs 5 which enable the surge arresters to be affixed to the ends of the limbs 3 of the brackets 2, for example by provision of a double and oppositely screw-threaded locking nut at the end of each limb 3 which can be turned with a spanner so as to pull the opposite ends of the respective two surge arresters together and into mounting engagement with the end of the respective limb.

Mounted at the ends of the limbs 3, after attachment of the surge arresters 1, are cast metal corona suppression bodies 6 which can for example form a push fit onto the ends of the limbs 3 with close conformance around the ends of the two surge arresters 1 that are attached to the respective limb. The surfaces of the bodies 6 are smoothly curved as shown to avoid giving

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rise to excessive field voltages such as might give rise to corona discharge effects.

At the top end of the series parallel arrangement, a corona suppression arrangement comprising parallel spaced-apart rings 7 and 8 which are coupled to the limbs 3 of the uppermost mounting bracket 2 by means of mounting brackets 9.

The illustrated series parallel surge arrester is believed to satisfy electrical requirements and the mounting brackets 2 and their accessories, namely the corona suppression bodies 6 and the arrester fixing nuts (not shown), can be manufactured at lower cost than the electrostatic mounting plates of the series parallel surge arrester described in GB-A-2230661. Furthermore, by virtue of the in line connection of the surge arresters of adjacent stages, the overall stiffness of the series parallel surge arrester can be increased as compared to that of GB-A-2230661. Otherwise the illustrated surge arrester obtains all of the advantages that are described in GB-A-2230661. Modifications and variations are of course possible without departure from the spirit and scope of the invention as set forth in the appended claims; for example, the brackets 2 could have more or less limbs than the four limbs shown.

Claims:

1. A high voltage surge arrester comprising a plurality of serially connected arrester stages each of which comprises a plurality of electrically  
5 matched low voltage surge arresters connected in parallel, the low voltage surge arresters of each stage being connected together and to the surge arresters of the or each next adjacent stage by means of a multiple limbed mounting bracket having corona suppression means at the end of each limb.
- 10 2. A high voltage surge arrester as claimed in claim 1 wherein at the top of the surge arrester the corona suppression means comprises at least one corona suppression ring.
- 15 3. A high voltage surge arrester as claimed in claim 1 or 2 wherein the corona suppression means at the ends of the limbs of the or each said mounting bracket supporting the ends of adjacent serial stages of the arrester comprise individual bodies associated each with a respective one of the limbs.
- 20 4. A high voltage surge arrester as claimed in any of the preceding claims which is adapted for station class operation and wherein the low voltage surge arresters are distribution class surge arresters.

5. A high voltage surge arrester as claimed in any of the preceding claims wherein the low voltage surge arresters are polymer housed solid state surge arresters.

5 6 A high voltage surge arrester substantially as herein described with reference to the accompanying drawing

PCT/GB99/04334

Technical drawing of a mechanical device, showing two views: I (top view) and II (side view).

**View I (Top View):** Shows a circular assembly. The central part is a hub (2) with four radial arms (3). The arms are connected to four outer rings (1). The entire assembly is enclosed in a circular housing (7) with a flange (8). The device is supported by two vertical columns (6) and has a base (5).

**View II (Side View):** Shows the side profile of the device. It highlights the vertical columns (6) and the base (5). The central hub (2) and the radial arms (3) are visible in the middle section. The outer rings (1) are shown as a series of stacked, curved segments.

**Labels:** 1, 2, 3, 4, 5, 6, 7, 8, 9.

**SUBSTITUTE SHEET (RULE 26)**

## DECLARATION FOR PATENT APPLICATION

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below of the subject matter which is claimed and for which a patent is sought on the invention entitled

the specification of which: (check one)

☐ is attached hereto. ☒ was filed on 21 December 1999 as United States Patent Application Serial No. or PCT International Application Number PCT/GB99/04334 and was amended on        19        (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with 37 CFR § 1.56(a) Prior Foreign Application(s): I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate listed below, or § 365(a) or any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed: IMPROVEMENTS RELATING TO ELECTRICAL SURGE ARRESTERS

			Priority Claimed
9828184.3 / (Application No)	United Kingdom (Country)	21 December 1998 / (Day/Month/Year Filed)	<input checked="" type="checkbox"/> [ ] Yes No
_____ (Application No)	_____ (Country)	_____ (Day/Month/Year Filed)	[ ] [ ] Yes No

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) Listed Below:

Application No.	Filing Date
_____	_____
_____	_____

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by 35 U.S.C. § 112, first paragraph, I acknowledge the duty to disclose material information as defined in 37 CFR § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

_____ (U.S. Application Serial No.)	_____ (U.S. Filing Date)	_____ (Status--patented, pending, abandoned)
_____ (U.S. Application Serial No.)	_____ (U.S. Filing Date)	_____ (Status--patented, pending, abandoned)

I hereby appoint Elliott I. Pollock, Registration No. 16,906; George Vande Sande, Registration No. 17,276; Burton A. Amernick, Registration No. 24,852; Richard Wiener, Registration No. 18,741; Townsend M. Belser, Jr., Registration No. 22,956; Morris Liss, Registration No. 24,510; Martin Abramson, Registration No. 25,787; George R. Pettit, Registration No. 27,369; Elzbieta Chlopecka, Registration No. 32,767; Eric J. Franklin, Registration No. 37,134; Jeffri A Kaminski, Registration No. 42,709; and William E. Curry, Registration No. 43,572, my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

Send Correspondence and Direct Telephone Calls to:

George R. Pettit  
Connolly Bove Lodge & Hutz L.L.P.  
Formally: Pollock, Vande Sande & Amernick, R.L.L.P.  
P.O. Box 19088  
Washington, D.C. 20036-3425 U.S.A.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: DOONE, Rodney Meredith Date June 21, 2001  
Inventor's Signature [Signature]  
Residence Address 77B Folders Lane, Burgess Hill, West Sussex, RH15 0DE, United Kingdom. GBX  
Citizenship: A British Citizen  
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## DECLARATION FOR PATENT APPLICATION

PAGE TWO

Full name of second joint inventor (if any): SHORT, Patrick George Date June 21, 2007

Inventor's Signature [Signature]

Residence Address 12 The Holt, Burgess Hill, West Sussex, RH15 0RF, United Kingdom. GBX

Citizenship A British Citizen

Post Office Address 12 The Holt, Burgess Hill, West Sussex, RH15 0RF, United Kingdom.

Full name of third joint inventor (if any): \_\_\_\_\_ Date \_\_\_\_\_

Inventor's Signature \_\_\_\_\_

Residence Address \_\_\_\_\_

Citizenship \_\_\_\_\_

Post Office Address \_\_\_\_\_

Full name of fourth joint inventor (if any): \_\_\_\_\_ Date \_\_\_\_\_

Inventor's Signature \_\_\_\_\_

Residence Address \_\_\_\_\_

Citizenship \_\_\_\_\_

Post Office Address \_\_\_\_\_

Full name of fifth joint inventor (if any): \_\_\_\_\_ Date \_\_\_\_\_

Inventor's Signature \_\_\_\_\_

Residence Address \_\_\_\_\_

Citizenship \_\_\_\_\_

Post Office Address \_\_\_\_\_

Full name of sixth joint inventor (if any): \_\_\_\_\_ Date \_\_\_\_\_

Inventor's Signature \_\_\_\_\_

Residence Address \_\_\_\_\_

Citizenship \_\_\_\_\_

Post Office Address \_\_\_\_\_

Full name of seventh joint inventor (if any): \_\_\_\_\_ Date \_\_\_\_\_

Inventor's Signature \_\_\_\_\_

Residence Address \_\_\_\_\_

Citizenship \_\_\_\_\_

Post Office Address \_\_\_\_\_